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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/914,005      | 01/11/2002  | Bernd Krause         | WEB 0044 PA         | 7204             |

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| EXAMINER |
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MENON, KRISHNAN S

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| ART UNIT | PAPER NUMBER |
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1723

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DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/914,005

Applicant(s)

KRAUSE ET AL.

Examiner

Krishnan S Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 16-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

Claims 16-34 are pending.

### *Specification*

The abstract of the disclosure is objected to because abstract contains a title, which need be removed. Correction is required. See MPEP § 608.01(b).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 16-27 and 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel et al (US 4,380,594) in view of Klotzer et al (5,980,795).

Siggel teaches a method of making a polymeric membrane comprising providing a mix of polymers (abstract, figures), a fluid that dissolves or gels in the polymer from 0.05 to 4.5% (col 2

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lines 54-59), charging the polymer mix with a gas (abstract), and foaming the polymer mix at temperature above glass transition (abstract), as in claim 16.

Siggel is silent on cooling the polymer membrane after foaming. Klotzer teaches cooling the membrane for stabilization (col 3 lines 45-50). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Klotzer in the teaching of Siggel to make hollow fiber membranes to obtain the desired properties of the membrane (Klotzer col 32-35)

Claims 17-20, 23-25 and 31 add further limitations which Siggel teaches as follows: The fluid is infiltrated in the polymer as in claim 17, and is added to the polymer during manufacture as in claim 18, fluid is a gas or a liquid as in claim 19 (abstract), organic liquid as in claim 20 (abstract). The gas is charged after heating above the glass transition temperature and then extruded to foam the polymer as in claim 23 (abstract). The gas is nitrogen or argon as in claim 24 (col 3 lines 51-53), and carbon dioxide as in claim 25 (col 3 lines 51-53). Hollow fiber membrane as in claim 31 (col 1 lines 54-59).

Claims 21, 22, 26, 27, 29, 30, 32, 33 and 34 add further limitations as follows: the polymer being charged with gas below the glass transition temperature and foamed above the glass transition temperature in claim 21, polymer charged after shaping gas at below the glass transition temperature in claim 22, and the polymer is saturated with gas in claim 26, claim 29 adds polymer material like polysulfone, cellulose etc, hollow surface fiber membrane in claim 30, which is asymmetric in claim 32 and 33, use of membranes in claim 34 - all of which Siggel does not teach. Klotzer teaches charging the gas below the glass transition temperature and then foaming at above the glass transition temperature (col 4 lines 19-40), charging gas after shaping and below the glass transition temperature (col 3 lines 51-57), gas is saturated (col 4 lines 29-31), thermoplastic polymer (like polysulfone, etc) (col 3 lines 64-67) and cellulose acetate (col 1 lines 39-41), asymmetric hollow

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surface and hollow fiber membrane (col 3 lines 50-63), and use as a filtration membrane as in claim 34 (col 4 lines 4-12). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Klotzer in the teaching of Siggel to make hollow fiber membranes to obtain the desired properties of the membrane (Klotzer col 32-35). Regarding claim 27, Siggel in view of Klotzer does not specifically state temperature between 100 and 200 C. However, Klotzer teaches temperature above glass transition temperature. It would be obvious to one of ordinary skill in the art at the time of invention that the glass transition temperature would depend on the polymer or the polymer mix selected and could be between 100 and 200C depending on the polymer or polymer mix. [glass transition temperature of polysulfone at 190C: ref: [www.boedeker.com/udel\\_p.htm](http://www.boedeker.com/udel_p.htm)].

2. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel (594) in view of Klotzer (795) as applied to claim 16 above, and further in view of Malon et al (US 5,013,767).

Siggel in view of Klotzer does not teach the solvents of the instant claim. Malon teaches 1-methyl 2-pyrrolidone, dichloroethane and other solvents for melt-extruded hollow fibers (col 14 lines 35-40, col 12 lines 34-36). It would be obvious to one of ordinary skill in the art at the time of invention to use the solvent for polysulfone as taught by Malon in the teaching of Siggel for making asymmetric gas separation membranes.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

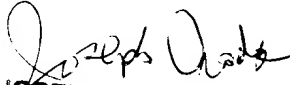
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone numbers for the organization

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where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan Menon  
Patent Examiner  
April 3, 2003

  
**JOSEPH DRODGE**  
**PRIMARY EXAMINER**